

(5.6) Connecting Standard and Vertex Forms

$y = ax^2 + bx + c$

$y = a(x - h)^2 + k$

1)  $y = (x - 3)^2 + 10$   
 $y = (x^2 - 3x + 9) + 10$   
 $y = x^2 - 6x + 19$   
 $a = 1$   
 $b = -6$

Vertex:  $(3, 10)$

\*\*\*\*look for patterns\*\*\*\*

2)  $y = 2(x + 4)^2 - 5$   
 $y = 2(x^2 + 8x + 16) - 5$   
 $y = 2x^2 + 16x + 32 - 5$   
 $y = 2x^2 + 16x + 27$   
 $a = 2$   
 $b = 16$

Vertex:  $(-4, -5)$

$X$  Vertex  $-\frac{b}{2a}$

3)  $y = 3(x - 1)^2 + 12$   
 $y = 3(x^2 - 2x + 1) + 12$   
 $y = 3x^2 - 6x + 3 + 12$   
 $y = 3x^2 - 6x + 15$   
 $a = 3$   
 $b = -6$

Vertex:  $(1, 12)$

$-\frac{(-6)}{2(3)} = \frac{+6}{6} = 1$   
 $x = 1, y = 12$

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To find the x-coordinate of the vertex from standard form:

$x = \frac{-b}{2a}$

Find the vertex of:

a)  $y = x^2 + 6x + 8$

$x = \frac{-6}{2(1)} = -3$

$y = (-3)^2 + 6(-3) + 8 = 9 - 18 + 8 = -1$

Vertex:  $(-3, -1)$

\* DOES NOT FACTOR

$x = \frac{-6}{2(1)} = -3$

$y = (-3)^2 + 6(-3) + 8 = 9 - 18 + 8 = -1$

Vertex:  $(-3, -1)$

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Second Technique Partial Factor To find the x-coordinate of the vertex from standard form:

a)  $y = x^2 - 6x + 10$

$y = (x - 3)^2 + 1$

Vertex:  $(3, 1)$

b)  $y = 2x^2 + 16x + 27$

$y = 2(x + 4)^2 - 5$

Vertex:  $(-4, -5)$

c)  $y = 3x^2 - 6x + 15$

$y = 3(x - 1)^2 + 12$

Vertex:  $(1, 12)$

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Review Ques  
Word Problems  
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Homework  
p.301 and 302  
  
q.2,3,5 a,c,f, 7 a, c e& 11

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